



## ABSTRACT OF THE DISCLOSURE

A catalyst is provided for addition polymerization of olefinically  
5 unsaturated monomers comprising a first compound MY, wherein M is a  
transition metal in a low valency state or a transition metal in a low valency  
state coordinated to at least one coordinating non-charged ligand, Y is a  
monovalent, divalent or polyvalent counterion; an initiator compound  
comprising a homolytically breakable bond with a halogen atom; and an  
10 organodiimine, where at least one of the nitrogens of the diimine is not part  
of an aromatic ring. A catalyst for addition polymerization of olefinically  
unsaturated monomers is also provided comprising a first component of

### Formula

$[ML]^{n+} A^{n-}$ , wherein M = a transition metal of low valency state, L  
15 = an organodiimine where at least one of the nitrogens of the diimine is not  
part of an aromatic ring, A = an anion, n = an integer of 1 to 3, m = an  
integer of 1 or 2;

e) An initiator compound comprising a homolytically breakable bond  
with a halogen atom.

Preferably, the organodiimine is a 1,4-diaza-1,3-butadiene, a pyridine carbaldelyde imine, an oxazolidone or a quinoline carbaldehyde.

Processes for using the catalysts are also disclosed.